

--16. (Once amended) A method for weighting a SAW interdigital transducer having a plurality of interdigitized electrode fingers comprising providing at least one internal surface edge of at least one interdigitized electrode finger with a shape sufficiently incongruent with the overall shape of said SAW transducer such that SAW wave velocity is dispersed along the fingers' length.--

#### Remarks

This amendment is being made in response to the Official Action mailed 4<sup>th</sup> October, 2001. Claims 1-23 are pending in the application. By the foregoing amendment, claims 1 is hereby cancelled and claim 24 is added, with all claims previously dependent on cancelled claim 1 now being amended to depend from claim 24. Claims 4-6 have been deleted and replaced by claims 28-30 and claims 21-23 have also been deleted and replaced with new claims 25-27. Claim 16 has been amended.

Claims 1-15 were rejected under 35 USC §112 as indefinite. Claims 1-3, 16, 21-23 were rejected under 35 USC §102(b) as anticipated by Yatsuda. Claims 1 and 4-6 were further rejected under 35 USC §102(b) as anticipated by Yanagihara et al. The Examiner has indicated that claims 7-15 and claims 17-20 recite allowable subject matter if they are rewritten in independent form to include all the limitations of their base claim and any intervening claims. The rejections are traversed and Applicant respectfully requests reconsideration and allowance of the claims as currently amended.

Applicant has replaced cancelled claim 1 with new claim 24 which, though broader in scope than claim 1, is believed to better describe and claim that which applicant believes to be the essence of his invention. In particular, the claim now clearly recites that what Applicant has discovered is a previously unknown and unrecognized relationship between the shaping of the internal surface edges of interdigitized electrode fingers and the SAW velocity dispersion effect. Additionally, the discovery of this relationship goes hand in hand with the discovery that inducing and even enhancing the SAW velocity dispersion effect to achieve desired weighting of IDTs is not only possible, but can be desirable and even easily manipulable resulting in greater utility of SAW wave devices.

More particularly, the invention as it is now claimed comprises providing at least one or more of the internal surface edges, i.e. facing edges between adjacent (often parallel) interdigitized fingers, with a shape that is incongruent with the overall shape of the transducer itself. Thus weighting might be achieved in a substantially rectangular transducer by providing non-straight internal surface edges between adjacent interdigitized electrode fingers, for example, as opposed to achieving weighting by manipulating current and voltages as is done in the prior art. Applicant has found that by appropriate shaping of internal surface edges between adjacent interdigitized electrode fingers, one can induce a SAW velocity dispersion effect strong enough to effect the desired weighting.

In rejecting claims 1-3, 16 and 21-23 as anticipated in view of Yatsuda, the Examiner asserts that Yatsuda "discloses shapes that inherently control[s] the dispersion effect." First of all, Yatsuda does not relate to interdigital transducers nor does he relate in any way to the weighting of IDTs. Yatsuda seeks to teach about controlling delays of SAW waves between IDTs by rotating the axes of one transducer relative to an opposite transducer, not methods of weighting the IDT itself. Another method of Yatsuda, seen in Figs. 11 and 12, relate to providing a single external surface (not an interdigital surface) of one external electrode finger on one transducer with a non-linear shape. However, Yatsuda is seeking to influence the delay between passage of the SAW beam from one transducer to another, and not to use shaping to induce a SAW velocity dispersion effect useful for weighting the transducer itself. Thus Yatsuda neither anticipates the invention as it is now claimed, nor does it even suggest the claimed invention.

In rejecting claims 1 and 4-6 as anticipated in view of Yanagihara, the Examiner asserts that disclosed therein are "non-identical electrodes...with non-uniform lengths and widths." However, Yanagihara also does not relate to any kind of interdigitized electrode surface edge shaping which can provide weighting by inducing a SAW velocity dispersion effect. Furthermore, the comments made above with respect to the rejection under Yatsuda are repeated herein with respect to Yanagihara as if more fully set forth.

Generally speaking, the prior art shows electrode fingers provided on transducers where the overall shape of the body of the transducer is itself tapered and the electrode fingers are arranged with a complementary tapering to mirror the shape of the whole transducer. In order to accomplish this, it is known to provide the electrode fingers and gaps between the

fingers with a complementary tapering as well. However, the shaping of the prior art fingers is specifically to compensate for, i.e. reduce the effects of, the velocity dispersion effect. In stark contrast to the prior art, the finger shaping called for by the present invention is provided for precisely the opposite reason, i.e. in order to induce velocity dispersion effect, thereby weighting the transducer itself and/or focusing the propagated SAW beam. The electrode fingers shaped according to the present invention can operate to provide transducer "apodization" by the novel mechanism of inducing and even magnifying SAW velocity dispersion.

The Examiner noted that references mentioned in the Specification must be cited in an Information Disclosure Statement and USPTO Form SB/08 in order to be considered. Applicant has prepared and submits herewith same.

**Marked-Up Version of Amended Claims:**

In the marked-up version of amended claims below, deletions are shown in brackets, and additions are underlined.

1. (Cancelled)
2. (Amended) A transducer according to claim [1] 24, wherein said interdigitalized finger is provided with a shape which controls the diffraction effect by either focussing, scattering or deflection of SAW beam resulting from the SAW velocity dispersion effect along the electrode fingers' lengths.
3. (Cancelled)
4. (Cancelled)
5. (Cancelled)
6. (Amended) A transducer according to claim [1] 24, wherein the shapes of said electrode fingers generally are not all identical.
7. (Amended) A transducer according to claim [1] 24, wherein said at least one interdigitized electrode finger has at least one edge shaped in the form of a curled bracket.
8. (Amended) A transducer according to claim [1] 24, wherein said at least one interdigitized electrode finger has at least one edge in the form of a rounded bracket.
9. (Amended) A transducer according to claim [1] 24, wherein said at least one interdigitized electrode finger has at least one edge in the form of a refracted line.
10. (Amended) A transducer according to claim [1] 24, wherein said at least one interdigitalized electrode finger has the shape of a rhombus.

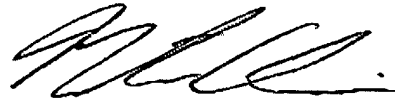
11. (Amended) A transducer according to claim **[1] 24**, wherein said at least one interdigitized electrode finger has at least a portion of one edge in the form of a curled bracket.
12. (Amended) A transducer according to claim **[1] 24**, wherein said at least one interdigitized electrode finger has at least a portion of one edge in the form of a rounded bracket.
13. (Amended) A transducer according to claim **[1] 24**, wherein said at least one interdigitized electrode finger has at least a portion of one edge in the form of a refracted line.
14. (Amended) A transducer according to claim **[1] 24**, wherein said at least one interdigitized electrode finger has trapezoidal form.
15. (Amended) A transducer according to claim **[1] 24**, wherein said at least one interdigitized electrode finger has at least a portion of one edge in the form of a bell.
16. (Amended) A method for weighting a SAW interdigital transducer having a plurality of interdigitized electrode fingers comprising providing at least one internal surface edge of at least one interdigitized electrode finger with a shape sufficiently incongruent with the overall shape of said SAW transducer such that [the] SAW wave velocity is dispersed along the [finger's] fingers' length.
24. (New) An interdigital transducer for surface acoustic waves having a desired weighting, said weighting being achieved by inducing a SAW velocity dispersion effect, said interdigital transducer comprising at least one plurality of interdigitized electrode fingers including at least two electrode fingers having between them at least two internal interdigitized electrode finger surface edges therebetween, at least one of said internal interdigitized electrode finger surface edges having an interdigital surface shape that is

sufficiently incongruent with the body shape of said transducer to result in a SAW velocity dispersion effect along the lengths of said fingers.

25. (New) A method for weighting a SAW interdigital transducer having a plurality of interdigitized electrode fingers, comprising providing at least one internal surface edge of at least one interdigitized electrode finger with a shape sufficiently incongruent with the overall shape of said SAW transducer such that SAW reflection coefficient is dispersed along said shaped electrode fingers' length.
26. (New) A method for controlling the diffraction spreading of SAW beams in a SAW interdigital transducer having a plurality of interdigitized electrode fingers, using the SAW velocity dispersion effect comprising providing at least one internal surface edge of at least one interdigitized electrode finger with a shape sufficiently incongruent with the overall shape of said SAW transducer.
27. (New) A SAW interdigital transducer having a plurality of interdigitized electrode fingers, said transducer being weighted by having at least one internal surface edge of at least one of said interdigitized electrode fingers having a shape which induces a SAW velocity dispersion effect.
28. (New) A transducer according to claim 24, wherein said transducer has a non-rectangular profile.
29. (New) A transducer according to claim 24, wherein the distances between adjacent electrode finger pairs are varied.
30. (New) A transducer according to claim 24, wherein said transducer is apodised by providing electrode fingers having varying lengths.

In view of the foregoing comments, it is believed that the rejections are traversed and that reconsideration and allowance of claims 2 and 6-30 is appropriate and is respectfully requested.

Respectfully submitted,



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